Behavior Research Methods, Instruments, & Computers

Joseph B. Sidowski, *Editor*
University of South Florida

CONSULTING EDITORS

Doris Aaronson, *New York University*
Christopher L. Cunningham, *Oregon Health Sciences University*
Donald A. Dewsbury, *University of Florida*
Donald Diener, *University of Nevada, Las Vegas*
William P. Dunlap, *Tulane University*
David A. Eckerman, *University of North Carolina, Chapel Hill*
Bert F. Green, Jr., *Johns Hopkins University*
Marshall M. Haith, *University of Denver*
Howard L. Kaplan, *Addiction Research Foundation, Toronto*
Richard S. Lehman, *Franklin and Marshall College*
Alan M. Lesgold, *University of Pittsburgh*
C. Michael Levy, *University of Florida*
Herschel W. Leibowitz, *Pennsylvania State University*
Richard A. Monty, *U.S. Army Human Engineering Laboratory*
James W. Pellegrino, *University of California, Santa Barbara*
Adam V. Reed, AT&T Bell Laboratories
Gene P. Sackett, *University of Washington*
William R. Uttal, *Arizona State University*
Louis Wood, *University of Arkansas at Little Rock*

Ellen Woodard
Executive Director

Anne Matson Dossett
Managing Editor

Volume 20

Published bimonthly by
THE PSYCHONOMIC SOCIETY, Inc., *1710 Fortview Road, Austin, Texas 78704*
Publication No. 703220 (ISSN 0743-3808)
Second Class Postage paid at Austin, Texas 78710
Copyright 1988 THE PSYCHONOMIC SOCIETY, Inc.

STAFF IN AUSTIN

John E. Bellquist
Chris Bezoff
Jeffrey Breaux
Calvin Cahan
Debra J. Chambers
Laura Crow
Kris Cummings
Ed Delgado
Patricia A. Dossett
Janis Dorough Foster
Edward Pope Goodson
Dreanne M. Grenier
Gayle Harris
Gary Harrison-Rashin
Christina Jackson
Kim Knutson
Mary Ann Kouneski
Diane Mankedick
Claudia McNutt
Jean S. Morgan
Diane Motz
Gerard B. Pringle
Michael F. Slattery, Jr.
Susan Sparks
Gail Tosto-Geiger
C. E. Wheeless

Contents of Volume 20

Abedi, J., & Shavelson, R. **FRACTION: A computer program for fractional factorial design** . 58
Adams-Webber, J. See Mitterer, J.
Aldridge, J. W., & Flores, S. A. **Random figures and mirror images with variable complexity, size, and orientation in Applesoft BASIC** 313
Algarabel, S., Ruiz, J. C., & Sanmartín, J. **The University of Valencia's computerized word pool** 398
Anderson, J. A. See Munro, P. W.
Anderson, M., Hornby, P., & Bozak, D. **COMPsych: A computerized software information system** . 243
Anderson, M. See Hornby, P.
Anson, J. **ROBREG: An APL procedure for fitting robust regression lines using Huber's M-estimate** 579
Barnes, O., Haith, M. M., & Roberts, R. J., Jr. **Simultaneous electronic recording of video and digital information on the video channel of a VTR or VCR** 32
Barnes, S., & Burke, R. S. **What is Apple-Psych?** 150
Baro, J. A., & Lehmkuhle, S. **A software system for recording and analyzing transient evoked potential data with an Apple IIe computer** 515
Becker, J. A. See Kimmel, H. D.
Beeman, M., & Gernsbacher, M. A. **Real-time language comprehension research using the Apple-Psych system** 164
Benjafield, J. **Solving path diagrams with EUREKA** 307
Berry, K. J., & Mielke, P. W., Jr. **APL approximations for common statistical critical values** . . . 339
Bevill, M. J. See Kimmel, H. D.
Bieber, L. L. See Brooks, J. O., III
Biggs, T. C., Pulham, D., & Bleasdale, F. A. **Apple slide tachistoscope** 49
Bleasdale, F. A. See Biggs, T. C.
Boles, D. B. **Voice recognition with the Apple-Psych system** 158
Bozak, D. See Anderson, M.
Bradley, R. See Graves, R.
Bremner, F. J. See Yost, M. (2)
Brennan, J. M., Nitz, L. H., & Daly, J. E. **An APL program for measures of association for ordinal variables** 429
Brennan, J. M. See Sakurai, M. M.
Brooks, J. O., III., & Bieber, L. L. **Digitized nonobjects for use with the Apple Macintosh computer** 433
Brophy, A. L. **A BASIC program for the multistage Bonferroni procedure for many correlations** . . 416
Bryant, P. K. See McConkie, G. W.
Burke, R. S. **Production and control of auditory signals in attention research using the Apple-Psych system** 171
Burke, R. S. See Barnes, S.
Butler, D. L. **A critical evaluation of software for experiment development in research and teaching** 218
Butler, D. L. **Selection of software in the instructional laboratory** 175
Cacioppo, J. T., Marshall-Goodell, B. S., Tassinary, L. G., Chen, F., Siegel, S. J., & Dorfman, D. D. **Waveform moment analysis: An ASYST program for topographical analyses of nonnegative bounded waveforms** 517
Carver, C. S., Dunham, R. G., Spitzer, M. W., & Delgado, L. M. **A tracking program to schedule subjects across multipanel longitudinal research** 576
Castellan, N. J., Jr. **Comments on applications of microcomputers in teaching** 193
Chandler, C. See Fernandes, A.
Chang, A. S. See Silverman, R. W. (2)
Chen, F. See Cacioppo, J. T.
Clarke, R. L., Smith, R. F., & Justesen, D. R. **An infrared device to monitor discrete ambulatory and stereotypic behaviors** 404
Conn, G., Stafiniak, P., DiPasquale, M. C., & Harper, L. **Effects of teaching an introductory psychology laboratory using a computerized research tool** 184
Cooper, L. D., Garcia, R., & Gibbon, J. **A labtop Macintosh: An interface and communications software for experiment control of animal learning research** 88
Costin, D. **MacLab: A Macintosh system for psychology labs** 197
Daly, J. E. See Brennan, J. M.
D'Andrea, J. A., & Knepton, J. **Construction and implementation of a low-cost electronic experiment control interface** 97
Dawson, D. L. **A BASIC factorial analysis of covariance program for three microcomputer families** 419
Dawson, M. R. W. **Fitting the ex-Gaussian equation to reaction time distributions** 54
Dawson, M. R. W. See Wright, R. D.
Delgado, L. M. See Carver, C. S.
DiPasquale, M. C. See Conn, G.
Dlhopolsky, J. G. **C language functions for millisecond timing on the IBM MC** 560
Dorfman, D. D. See Cacioppo, J. T.
Dragsbaek, H. See Popper, R.
Duncanson, C. See Leith, C. R.
Dunham, R. G. See Carver, C. S.
Dunlap, W. P., & Kemery, E. R. **Biserial and point-biserial correlation with correction for nonoptimal dichotomies** 420
Eamon, D. B. **Enhancing Applesoft using ampersand routines** 224
Eamon, D. B. **Problems with evaluation of courseware for instruction in psychology** 178

Eddy, D. R. **Three-dimensional, on-line color graphics representation in complex decision-making tasks** ... 118
Edwards, J. C. See Vercruyssen, M.
Emerson, P. L. **The best crude timer for MS-DOS implementations of C** ... 583
Emerson, P. L. **Compact C language Fourier analysis on small computers** ... 423
Emerson, P. L. **FISHTAIL: Practical *F* integration on small computers in BASIC and C** ... 65
Emerson, P. L. **TIMEX: A simple IBM AT C language timer with extended resolution** ... 566
Emerson, P. L. **Using serial interfaces and the C language for real-time experiments** ... 330
Fernandes, A., Tigges, M., Tigges, J., Gammon, J. A., & Chandler, C. **Management of extended-wear contact lenses in infant rhesus monkeys** ... 11
Flores, S. A. See Aldridge, J. W.
Foltz, G. S. See Poltrock, S. E.
Franks, I. M. **A method for investigating the sequential ordering of simple movement patterns: An IBM-based application using the Tecmar Labmaster** ... 298
Gammon, J. A. See Fernandes, A.
García-Pérez, M. A. **HDC: A subroutine library for image processing using Burt's hierarchical discrete correlation** ... 317
Garcia, R. See Cooper, L. D.
Gasen, J. B. See Redmond, R. T.
Genovese, R. F. **A strategy for microcomputer-controlled measurement of responses in the behavioral laboratory** ... 1
Geri, G. A., & Neri, D. F. **Validation of a solid-state anomaloscope used to assess red-green color vision defects** ... 27
Gernsbacher, M. A. See Beeman, M.
Gibbon, J. See Cooper, L. D.
Gibbs, C. M. See Gormezano, I.
Gibson, J. M., & Watkins, M. J. **A pool of 1,086 words with unique two-letter fragments** ... 390
Gindler, L. See Yost, M.
Glaser, W. R. **Technical improvements to the projection tachistoscope** ... 491
Gorea, A. See Papathomas, T. V.
Gormezano, I., & Gibbs, C. M. **Transduction of the rabbit's nictitating membrane response** ... 18
Graves, R., & Bradley, R. **More on millisecond timing and tachistoscope applications for the IBM PC** ... 408
Greene, S., Ratcliff, & McKoon, G. **A flexible programming language for generating stimulus lists for cognitive psychology experiments** ... 119
Grip, J. See Merbitz, C.
Haith, M. M. See Barnes, O.
Hamm, H. D. See Leith, C. R.
Harper, L. See Conn, G.
Heathcote, A. **Screen control and timing routines for the IBM microcomputer family using a high-level language** ... 289
Hewett, T. T. **The electronic spreadsheet as a professional productivity tool** ... 231
Hewett, T. T. **Some observations on applications of microcomputers in teaching** ... 191
Hirsch, E. See Popper, R.
Hochberg, J. See Krauss, R. M.
Hodge, M. H., & Pittenger, D. J. **More statistical programs for Commodore computers** ... 427
Hornby, P., & Anderson, M. **Using computers in introductory psychology** ... 180
Hornby, P. See Anderson, M.
Jones, J. A., Miller, B. O., & Scarborough, D. L. **A rule-based expert system for music perception** ... 255
Justesen, D. R. See Clarke, R. L.
Kemery, E. R. See Dunlap, W. P.
Kendall, R. A. **A sample-to-disk system for psychomusical research** ... 129
Kimmel, H. D., Becker, J. A., & Bevill, M. J. **Balanced incomplete blocks to control individual differences** ... 310
Kimmel, H. D. See Lachnit, H.
Kingma, J., & Taerum, T. **A FORTRAN 77 program for a nonparametric item response model: The Mokken scale analysis** ... 471
Knepton, J. See D'Andrea, J. A.
Koh, K. See Maloney, L. T.
Krauss, R. M., Morrel-Samuels, P., & Hochberg, J. **VIDEOLOGGER: A computerized multichannel event recorder for analyzing videotapes** ... 37
Krieg, E. F., Jr. **A FORTRAN 77 program for the runs test** ... 361
Kush, J. C. See Watkins, M. W.
Lachnit, H., Schneider, R. L., Lipp, O. V., & Kimmel, H. D. **RWMODEL: A program in Turbo Pascal for simulating predictions based on the Rescorla-Wagner model of classical conditioning** ... 413
Latimer, C. R. **Eye-movement data: Cumulative fixation time and cluster analysis** ... 437
Lehman, R. S. **The languages we use** ... 236
Lehmkuhle, S. See Baro, J. A.
Leith, C. R., Hamm, H. D., Duncanson, C., & Senical, T. **A computer-driven undergraduate laboratory curriculum and related support logistics** ... 188
Liebhaber, M. J. **A computer model of inflection learning** ... 246
Lipp, O. V. See Lachnit, H.
Loftus, G. R. See Stoddard, P. K.
Lordahl, D. S. **Repairing the Microsoft BASIC RND function** ... 221
MacLeod, C. M. See Turner, S. L.
Maloney, L. T., & Koh, K. **A method for calibrating the spatial coordinates of a visual display to high accuracy** ... 372
Marqui, H. P. See Merbitz, C.
Marshall-Goodell, B. S. See Cacioppo, J. T.
McClelland, J. L., & Rumelhart, D. E. **A simulation-based tutorial system for exploring parallel distributed processing** ... 263
McConkie, G. W., Scouten, C. W., Bryant, P. K., & Wilson, J. **A microcomputer-based software package for eye monitoring research** ... 142

McHale, M. A. See Wolach, A. H.
McKoon, G. See Greene, S.
Merbitz, C., Grip, J., & Marqui, H. P. **A jiffy clock for the Apple IIc, II+, and IIe with a mouse**. 362
Michael, D. N. See Wogan, M.
Mielke, P. W., Jr. See Berry, K. J.
Miller, B. O. See Jones, J. A.
Mitterer, J., & Adams-Webber, J. **OMNIGRID: A general repertory grid design, administration, and analysis program** 359
Moran, G. See Symons, D. K.
Morrel-Samuels, P. See Krauss, R. M.
Munro, P. W., & Anderson, J. A. **Tools for conntectionist modeling: The dynamical systems methodology** 276
Mutz, G. See Teder, W.
Nasman, V. T. See Yost, M.
Nason, S., & Zarbrucky, K. **A program for comprehension monitoring of text using HyperCard for the Macintosh** 499
Neri, D. F. See Geri, G. A.
Nitz, L. H. See Brennan, J. M.
Null, C. H. **Science, politics, and computers** ... 73
Olivo, R. F., & Thompson, M. C. **Monitoring animals' movements using digitized video images** 485
Osgood, G. **Generalizing the Apple-Psych system** 155
Owens, D. A. See Tyrrell, R. A.
Palya, W. L. **An introduction to the Walter/Palya controller and ECBASIC** 81
Palya, W. L. See Weisman, R.
Papathomas, T. V., & Gorea, A. **Simultaneous motion perception along multiple attributes: A new class of stimuli** 528
Pevey, M. E. **Using an IBM PC to network Walter/Palya experiment controllers** 100
Pfleger, W. See Teder, W.
Pittenger, D. J. See Hodge, M. H.
Poltrock, S. E., & Foltz, G. S. **APT PC and APT II: Experiment development systems for the IBM PC and Apple II** 201
Popper, R., Dragsbaek, H., Siegel, S. F., & Hirsch, E. **Use of pocket computers for self-administration of cognitive tests in the field** .. 481
Pulham, D. See Biggs, T. C.
Ratcliff, R. See Greene, S.
Redmond, R. T., & Gasen, J. B. **PAST: Viewing the programming process** 503
Roberts, R. J., Jr. See Barnes, O.
Rose, D. **ZSCORE: A program for the accurate calculation of z scores, d', and β** 63
Rossi, J. S. **ONEWAY: A BASIC program for computing ANOVA from group summary statistics** 347
Ruiz, J. C. See Algarabel, S.
Rumelhart, D. E. See McClelland, J. L.
Russell, R. W. See Silverman, R. W. (2)
Sakurai, M. M., & Brennan, J. M. **Computing the von Neumann–Morgenstern characteristic function $v(S)$ for cooperative n-person transferable utility normal form games: LP and saddlepoint solutions** 367
Sanmartín, J. See Algarabel, S.
Scarborough, D. L. See Jones, J. A.
Schneider, R. L. See Lachnit, H.
Schneider, W. **Micro Experimental Laboratory: An integrated system for IBM PC compatibles** ... 206
Schneider, W. **Sensitivity analysis in connectionist modeling** 282
Schwarzer, R. **Meta-analysis programs** 338
Scouten, C. W. See McConkie, G. W.
Segalowitz, S. J. **IBM PC tachistoscope: II. Assembly language subroutines** 432
Senical, T. See Leith, C. R.
Sidowski, J. B. **Editorial** 71
Shavelson, R. See Abedi, J.
Siegel, S. F. See Popper, R.
Siegel, S. J. See Cacioppo, J. T.
Silverman, R. W., Chang, A. S., & Russell, R. W. **Measurement of activity in small animals using a microcomputer-controlled system** 537
Silverman, R. W., Chang, A. S., & Russell, R. W. **A microcomputer-controlled system for measuring reactivity in small animals** 495
Smith, R. F. See Clarke, R. L.
Spitzer, M. W. See Carver, C. S.
Stafiniak, P. See Conn, G.
Stappers, P. J. **Improved calibration of color video projectors by means of computer animation** .. 573
Stoddard, P. K., & Loftus, G. R. **An IBM XT-compatible, computer-based, slide-projector laboratory** 541
Stout, C. E. **Personal computer software for teaching differential psychodiagnostics** 106
Strube, M. J. **A BASIC program for the generation of Latin squares** 508
Strube, M. J. **Calculation of significance regions for multiple predictors by the Johnson-Newman technique** 510
Strube, M. J. **Three computer-automated social psychology laboratory tasks** 557
Symons, D. K., Wright, R. D., & Moran, G. **Computing lag sequential statistics on dyadic time interval data: The TLAG program** 343
Taerum, T. See Kingma, J.
Tassinary, L. G. See Cacioppo, J. T.
Teder, W., Mutz, G., & Pfleger, W. **A digitally controlled universal second-order filter block for biosignals with CMOS D/A converters** 552
Thompson, M. C. See Olivo, R. F.
Tigges, J. See Fernandes, A.
Tigges, M. See Fernandes, A.
Turner, S. L., & MacLeod, C. M. **SLIDE MAKER: A BASIC program to create 35-mm slides of verbal materials** 355
Tyrrell, R. A., & Owens, D. A. **A rapid technique to assess the resting states of the eyes and other threshold phenomena: The Modified Binary Search (MOBS)** 137
Vercruyssen, M., & Edwards, J. C. **ANOVA/TT: Analysis of variance teaching template for Lotus 1-2-3** 349

Walter, D. E. **The Walter/Palya experiment controller users' group meeting and help session**. 104
Watkins, M. J. See Gibson, J. M.
Watkins, M. W., & Kush, J. C. **Micro-CONGRU: A microcomputer program for measuring levels of overall and partial congruence among multiple observers on nominal scales**..... 513
Weisman, R., & Palya, W. L. **Development and operating environments for a network of Walter/Palya experiment controllers on the Macintosh computer**..... 93
Wilson, J. See McConkie, G. W.
Wilson, M. **MRC Psycholinguistic Database: Machine-usable dictionary, version 2.00**..... 6
Wogan, M., & Michael, D. N. **A high-gain, low-noise amplifier for EEG**..... 22
Wolach, A. H. **ANOVA, Latin square, and ANOCOVA for IBM-compatible microcomputer systems**..... 585
Wolach, A. H., & McHale, M. A. **Orthogonal comparisons**..... 337
Wood, D. L. **Advanced algorithms for the numerical integration of *t***..... 60
Wright, R. D., & Dawson, M. R. W. **Using hardware interrupts for timing visual displays and reaction-time key interfacing on the Commodore 64**..... 41
Wright, R. D. See Symons, D. K.
Yost, M., Bremner, F. J., & Nasman, V. T. **Using three-dimensional graphics in neuropsychological hypothesis testing**..... 108
Yost, M., Gindler, L., & Bremner, F. J. **Multivariate statistics and three-dimensional graphics**.. 113
Zabrucky, K. See Nason, S.

NOTES AND ANNOUNCEMENTS

Publications Office accepts manuscripts on disk... 70
87
18th Annual Meeting of the Society for Computers in Psychology..... 72
29th Annual Meeting of the Psychonomic Society. 363
435
New editor of *Animal Learning & Behavior*..... 364
IEEE Workshop on Visual Motion..... 365
Second Conference of the International Federation of Classification Societies..... 436
National Science Foundation Program for Advanced Study in Psychophysiology..... 587
Second International Facet Theory Conference.... 588

ACKNOWLEDGMENTS

The individuals listed below served as consultants. The Editor wishes to thank each for critical evaluations of manuscripts and contributions to the quality of this Journal.

Stuart Anstis, *York University*
Roger Bakeman, *Georgia State University*
James A. Ballas, *George Mason University*
John D. Batson, *Furman University*
Peter Bentler, *University of California at Los Angeles*
William Biersdorf, *University of South Florida*
Nigel W. Bond, *Macquarie University*
Lyle Bourne, *University of Colorado*
Gwen Campbell, *University of South Florida*
Patricia Carpenter, *Carnegie-Mellon University*
R. L. Clarke, *VA Medical Center, Kansas City*
Michael Coovert, *University of South Florida*
Richard Ectright, *University of Western Ontario*
Michael Friendly, *York University*
John Galla, *Widener University*
I. Gormezano, *University of Iowa*
P. Graf, *University of British Columbia*
William Greene, *Eastern Washington State University*
Karl Haberlandt, *Trinity College at Hartford*
Milton H. Hodge, *University of Georgia*
Pierre Jolicoeur, *University of Waterloo*
Edward S. Katkin, *SUNY Stony Brook*
Robert S. Kennedy, *Essex Corporation*
Judith F. Kroll, *Mount Holyoke College*
Mary LaLomia, *University of South Florida*
Geoffrey Loftus, *University of Washington*
Phillip H. Marshall, *Texas Tech University*
Richard Mayer, *University of California at Santa Barbara*
George McConkie, *University of Illinois*
Paul A. McDermott, *University of Pennsylvania*
Jerry W. O'Dell, *Eastern Michigan University*
Gerald Patterson, *Oregon Social Learning Center*
L. J. Peacock, *University of Georgia*
David J. Pittenger, *University of Georgia*
Stephen Porges, *University of Maryland*
Dennis Proffitt, *University of Virginia*
Keith Rayner, *University of Massachusetts*
Henry Roediger III, *Purdue University*
David Rubin, *Duke University*
Christine L. Schlichting, *U.S. Naval Submarine Research Laboratory*
Charles J. Sciata, *Pennsylvania State University*
L. F. Scinto, *Applied Science Laboratory*
Sidney J. Segalowitz, *Brock University*
Arnold Small, *University of Iowa*
Robert Solso, *University of Nevada at Reno*
P. J. Strappers, *Delft University of Technology, Netherlands*
Michael J Strube, *Washington University*
Jennie Weng, *University of California at Los Angeles*
Richard Wright, *University of Western Ontario*
Michael Yost, *Trinity University*